Red Tractor Assurance *for Farms*

**Fresh Produce Scheme**

# Crop Module: Peas ( picking, fresh )

Effective 1st September 2015

Red Tractor Assurance

# Welcome

Red Tractor Assurance for Farms
Fresh Produce Scheme

This crop specific module for peas has been written to complement and avoid duplicating the generic principles of the Red Tractor Farm Assurance Fresh Produce Scheme standards. It is advisable to read the Red Tractor Farm Assurance Fresh Produce standards before reading this crop specific module. This module is designed to stimulate thought in the mind of the reader. It contains crop specific guidance and standards, where applicable, in addition to the requirements stated in the generic Fresh Produce standards.

Within this module the important requirements outlined in the crop specific standards section will be verified during the Red Tractor Farm Assurance assessment and compliance will form a part of the certification/approval decision.

## Disclaimer and trade mark acknowledgement

Although every effort has been made to ensure accuracy, Assured Food Standards does not accept any responsibility for errors and omissions. Trade names are only used in this module where use of that specific product is essential. All such products are annotated® and all trademark rights are hereby acknowledged.

**Notes:** Pesticide Information

The Red Tractor Fresh Produce team has been working with Fera to provide tailored access to the LIAISON database for all Red Tractor Fresh Produce members. This system allows individual growers access to all information for plant protection products approved for use under the Red Tractor Fresh Produce Scheme.

LIAISON can be accessed under the Produce tab via the “Checkers and Services” page where you will also find a user manual. Searches will be filtered specifically for the crops for which you are registered. Once you have logged onto the site and clicked on the LIAISON hyperlink you will be directed to the LIAISON home screen.

You will need a username and password and these will be sent once you have registered:

**http://assurance.redtractor.org.uk/rtassurance/services/Registration/members.eb** .

## General Introduction

Following a systematic approach will help growers identify and manage the risks involved in crop production. This module is based on a typical crop production process and food safety, health & safety, environmental and quality hazards are identified. Appropriate controls may then be established to minimise risk. Food safety and health & safety issues always take precedent over quality and environmental controls. The layout of this module follows the same structure as that used in the Red Tractor Farm Assurance Fresh Produce Standards. The content of the module is reviewed prior to the issue of updated editions. The review process considers both new developments and all relevant technology which has emerged since the last review was completed and which have been found to be both workable by the grower and beneficial to the environment. The aim is to transfer such information and technologies to growers.

## Acknowledgements

Red Tractor Farm Assurance Fresh Produce gratefully acknowledges the contribution of all consultees in the preparation of this protocol, particularly Anthony Biddle and Becky Ward of the Processors & Growers Research Organisation and Cathy Knot.

**Front cover image credit:** British Growers Association Ltd.

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## ADDITIONAL REQUIREMENTS AGAINST CURRENT STANDARDS

**None for this crop module**

## CROP SPECIFIC STANDARDS

| STANDARDS | HOW YOU WILL BE MEASURED | RECORDS (to be kept for 2 years) |
|---|---|---|
| CQ.49.a<br>**Weeds must be controlled to prevent yield loss and avoid difficulties with the machine harvester** | ■ perennial grasses are eradicated with an application of glyphosate in autumn before sowing peas<br>■ weeds that have not been eliminated by cultivations are killed, prior to sowing, with non-selective herbicides (e.g. glyphosate) | |
| CQ.49.b<br>**Growers must adopt a policy for reducing volunteer problems for oilseed rape and potatoes** | ■ potatoes are not ploughed down after the harvest, as this aids their survival. Potatoes left on or near the surface are likely to be affected by frosts or eaten by animals | |

# GUIDANCE

## CHOICE OF VARIETY OR ROOTSTOCK AND PLANT HEALTH CERTIFICATION

### Sowing

Continuity of cropping is achieved with the use of varieties with maturities from early to late and/or with sequential sowings based on accumulated heat units or on observations of seedling development.

Cereal drills are suitable for sowing peas, which are drilled at about 5cm depth. The seed is thus covered by about 2-3cm of settled soil after rolling, sufficient to avoid damage from any leaching of residual herbicides.

## SITE AND SOIL MANAGEMENT

### Climate

Excessive rainfall during the later stages of pea growth is undesirable. Plant habit becomes indeterminate and flowering prolonged. The bulk of haulm produced contributes to a humid microclimate that encourages fungal growth.

Temperature is not a limiting factor to pea growing within the UK, but it influences earliness of drilling which can be achieved and rate of growth. Peas do not grow at temperatures below 4.4°C. Although peas at early growth stages can survive frost, more advanced crops suffer damage. Damage from frost is unlikely if peas are sown after mid-February. Picking pea varieties have not been bred for winter hardiness.

### Crop rotation

Crop rotation is essential to reduce the build-up of pests and soil-borne diseases. Several root-infecting fungi cause foot and root rots to both peas, field, broad and green beans. All pea and bean crops should be treated as one crop and a break of at least four legume-free years should be maintained between them.

### Soil type

Deep, free-working loams are suitable for peas. Extremes of soil type are to be avoided: drought prone sands (unless irrigated) and heavy clays are unsuitable. Pea roots are very sensitive to the physical condition of the soil and compaction and waterlogging are very damaging.

## ENVIRONMENTAL PROTECTION & CONTAMINATION CONTROL

### THE BASIC APPROACH TO CROP PROTECTION

The guiding principle is that pesticide use should be minimised. An integrated approach should be adopted to achieve this involving the following management steps.

### Planning

a. Sensible crop rotations to avoid build-up of problems

b. Careful site selection to avoid potential or previous problems thereby enhances crop health and cleanliness

c. Inclusion of resistant varieties in cropping programmes whilst retaining the required quality parameters and eating characteristics

### Cultural preventative techniques

a. Good crop and field hygiene

b. Promoting crop health by ensuring effective nutrient availability through soil analysis and accurate application of fertilisers and trace elements

c. Utilising available irrigation to promote healthy growth and as a control measure wherever appropriate and feasible

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**Corrective action**

Where corrective or protective action is necessary the following approach should be adopted.

a. The need to take corrective or protective action must be established by regular monitoring and reference to established thresholds. The effect of prevailing and predicted weather conditions on the need for treatments must be considered

b. The availability and use of biological and natural methods of pest and disease control must be reviewed and applied if appropriate

c. Where chemical control is essential:

- The least toxic and persistent product should be selected with due regard to its efficiency and ecotoxicity.
- The minimum effective dose should be used.
- Seed treatment should be considered as a first line of defence against certain diseases.
- An appropriate application method with effectively maintained equipment should be chosen.
- Selective and spot treatments should be used whenever appropriate.
- The use of foliar fungicides should be justified.

### APPROVED USES NOT INCLUDED ON THE PRODUCT LABEL

In many circumstances, particularly for minor crops, product labels do not include all of the approved uses and growers wishing to check the approval notice of a particular product should note that this information is available using the LIAISON® search accessible via their Red Tractor Farm Assurance home page after logging in.

A search on the 'Specific Off-Label Approvals' (now EAMU) page of LIAISON® by crop or product name should yield a results page. A click on the product name should link to a summary of the approval information. Near the bottom of the summary is the specific off-label or EAMU number and this link will open up a pdf of the current document giving details of the extension of authorisation for use.

## PEST, DISEASE AND WEED CONTROL

### PEST CONTROL

**Pea weevil (*Sitona lineatus*)**

Early sown crops in a dry spring can be more severely affected by pea weevil. The adults feed on the leaves leaving semi-circular notches around the leaf margins. Larvae from eggs laid by weevils during the feeding period, feed below ground on the root nodules. Occasionally, backward crops are retarded by a heavy weevil attack, but often, peas outgrow the initial setback.

**Chemical control:** Often crops recover from weevil attack and treatment is unnecessary, but where damage is experienced every year and crops are growing slowly, an insecticide applied at the first sign of leaf injury will reduce leaf injury and disrupt egg laying.

**Cultural control:** Avoid producing cloddy seedbeds that are preferred by the weevils. A well-established crop, growing in good soil conditions, is more likely to grow away from the effects of the weevil. Later drilled crops are less likely to suffer severe attacks. A monitoring system is available from Agralan Ltd, Ashton Keynes, Swindon.

**Pea cyst nematode (*Heterodera gottingiana*)**

Peas affected by pea cyst nematode usually show signs of failure in late June. The damage occurs in clearly defined patches, in which the plants are short, upright and small leafed. Flowering commences early and the foliage becomes increasingly yellow. The root system is poorly developed, there are very few nodules present and many tiny, cream to brown coloured lemon-shaped cysts can be found embedded in the root surface. Peas within the infested areas usually die prematurely.

**Chemical control:** No approved nematicides are available.

**Cultural control:** Pea cyst nematode builds up in the soil as a result of frequent cropping with host crops. These include field and broad beans, sweet peas and vetches. A rotation of one of these crops in five years will help to prevent the establishment of the nematode. Once present, the cysts are very persistent and may remain viable for twenty years or longer. Where infestation is suspected, soil samples can be assayed for pea cyst nematode and further cropping should be avoided and care taken to avoid transport of soil from infested areas to clean fields. There are no varieties available which are resistant to pea cyst nematode.

**Pea aphid (*Acyrthosiphon pisum*)**

The large green aphids produce colonies in the growing points of peas causing flower loss, poor pod development and severe loss of yield if uncontrolled. They can also transmit viruses including pea enation mosaic virus.

**Chemical control:** Several approved insecticides are available for control of pea aphid. There are no reports of insecticide resistant strains in the UK. Crops should be examined regularly, particularly as they begin to flower and sprayed when aphids can be found on 15% of the plants. On late sown peas, examination should commence about three weeks after seedling emergence.

**Cultural control:** If the aphid threshold is not reached, then spraying is unnecessary. Pea aphid migrate to the crop in early summer from overwintering hosts and therefore cropping peas next to clover or lucerne should be avoided. Aphids are predated by ladybird and hoverfly larvae and low infestations may be kept down by these insects. Early sown or autumn planted peas may be harvested before pea aphid numbers build up and control may be unnecessary.

**Pea moth (*Cydia nigricana*)**

Peas producing flowers from mid-June onwards are susceptible to attack particularly in areas where combining peas have been grown for several years. Damage is caused by the caterpillar that feeds on peas inside the pod. The moths are small (10-12mm), silvery brown and fly to flowering peas on warm days from June onwards. The larvae are creamy white, 3-6mm and can be found inside the pod.

**Chemical control:** Insecticides should be applied to control the caterpillar as it leaves the egg and moves to the young developing pod. Monitoring of pea moth is carried out using a pheromone-based pea moth trap (Oecos Ltd). Traps are placed in the pea field in mid-May and when moths are caught, a single spray is applied to crops as soon as they have produced the first pod.

**Cultural control:** Pea moth populations develop where peas are left in the field to full maturity. Areas where combining peas are grown are likely to be a reservoir of moths. In other situations, unharvested green peas should be ploughed in before the larvae have left the dried pods, so breaking the life cycle. Early maturing peas may miss the moth flight period so control will be unnecessary. Growers with monitoring traps need not spray if no moths are caught.

**Pea thrips (*Kakothrips pisivorus*)**

During and after flowering, infestations of thrips are likely to occur in humid conditions, especially following a dry spring. The dark brown to black elongated adults and orange nymphs are 1.5 - 1.8mm long and can be found within the flowers and on the young pods. Damage occurs as the insects feed on the outside of the pod wall, which becomes silver-coloured and distorted. Damaged pods are then unmarketable.

**Chemical control:** Crops should be examined as they begin to flower and where thrips are found to be plentiful, an insecticide should be applied as soon as the crops produce the first pod.

**Cultural control:** Peas are only seriously attacked by pea thrips where the crops are growing in intensively cropped ground in close proximity to the previous season's pea crops. Because the thrips complete their life cycle in the soil, crop rotation will help to minimise the risk of heavy infestation.

**Pea midge (*Contarinia pisi*)**

An occasional pest of fresh picked peas, particularly in Yorkshire, midge damage can cause yield loss in some seasons. The tiny midge adults lay eggs close to the developing flower bud and the larvae then feed at the base of the flowers causing them to become sterile. Larvae then emerge from damaged flowers and fall to the soil where they overwinter.

**Chemical control:** Where the pest is known to be a problem each year, a monitoring system using pheromone traps is available from Oecos, Kimpton, Herts. Traps should be placed in early June in fields which grew peas the previous year. Regular monitoring shows peak activity and susceptible crops should be examined immediately and an insecticide applied to the crop as soon as adults are found within the shoots to help reduce egg laying. Plants should be examined as they reach the greed bud stage by picking together the leaves surrounding the buds and then opening up the leaves to look for the presence of the adult.

**Cultural control:** Varieties of peas with an extended flowering period can compensate for some loss of flowers and pods and should be grown in areas where midge is known to be a problem. Cropping in close proximity to the previous years infested crops should also be avoided. Where no midges are caught in the monitoring traps, crops in the near vicinity should not be sprayed.

**Silver Y moth (*Autographa gamma*)**

The caterpillars of silver Y moths are voracious feeders of leaves, stems and pods. Large infestations occur sporadically as a result of migrating adults from North Africa. The moth is silvery-brown with a wingspan of 3.5 - 4.0cm and flies during the day, and feeds on nectar. Caterpillars vary in colour from bright green to light brown and move in a characteristic looping motion. When mature, the caterpillars spin a silken cocoon in the foliage where they produce a black chrysalis. After 7-10 days, the moths emerge, but a second generation does not usually produce significant numbers of caterpillars.

**Chemical control:** The arrival of adults into the crop can be monitored using pheromone traps (Agralan Ltd) which should be placed in flowering peas from mid-May. If large catches are recorded in the traps, damage from caterpillars is likely to occur about 2 weeks later. If caterpillar numbers are causing significant damage, an insecticide should be applied when the largest caterpillars are about 2 - 3cm in length. Pyrethroid insecticides currently approved for pea moth control offer an effective means of control, together with a short harvest interval.

**Cultural control:** Good control of weeds will help discourage immigration of Silver Y moths.

**Slugs (*Deroceras spp.*)**

Slug feeding can result in poor seedling establishment on wet or heavy soils with high organic matter. Seedling stems may be rasped through and the appearance of ragged leaves and slime trails are characteristic of slug attack. Later in the season, in wet conditions, slugs can feed higher in the foliage and on the pods themselves causing feeding damage.

**Chemical control:** Slug damage to seeds and seedlings can be reduced using broadcast pellets or bait early in the crop growth stage as it is difficult to control slugs when the crop is dense. Late applications of pellets or bait may be helpful in preventing pod damage although control may not be very effective.

**Cultural control:** Soils which contain high levels of straw or where residues of the previous crop are abundant tend to harbour slugs. Such debris should be well dispersed, chopped and spread or disked before ploughing in the autumn. Slug populations are encouraged where oilseed rape is included in the rotation. Maintaining a firm seed bed will also reduce slug activity in the spring.

## DISEASE CONTROL

**Damping off (*Pythium spp.*)**

Peas sown early in cold and wet conditions are prone to pre-emergence damping-off diseases. The main fungus attacking peas is *Pythium ultimum*, although other species may also be involved. The seed is attacked shortly after imbibition and a soft rot develops which eventually affects the developing root and shoot. Seedlings may fail to emerge, or collapse shortly after emergence.

**Chemical control:** Seed treatments that contain thiram or metalaxyl protect the seed and seedlings from infection.

**Cultural control:** Avoid planting in cold wet soil conditions and for early maturing varieties, choose seed of high vigour. The electrical conductivity test for assessing pea seed vigour can be carried out by several seed testing laboratories and seed with medium vigour should only be used for later sowings when soil conditions are warmer. Good soil structure is also important and peas should not be sown deeper than 5cm to allow rapid germination and emergence.

**Foot rot/root rot (*Fusarium solani f.sp. pisi, Phoma medicaginis var pinodella/Aphanomyces euteiches*)**

Affected plants appear in patches or along sections of rows, with symptoms that begin to show up from mid-May to July. Plants are stunted, pale and the lower foliage may dry up. The flowering period is shortened and often infected plants die before pods have developed. The root system may be brown and poorly developed and the base of the stem discoloured. Fusarium causes a brick-red discolouration in the vascular tissue which can be found after scraping back the epidermis at the stem base with a sharp knife. Infection by Phoma results in a blackening of the stem base which eventually shrivels the stem causing the plants to collapse or break-off at soil-level. Aphanomyces root rot is encouraged by wet soils. The roots are discoloured and outer layers of tissue easily slough off, leaving the stringy vascular tissue intact.

**Chemical control:** No fungicides are approved for the control of these soil-borne diseases, however, *Phoma medicaginis* can be seed-borne and seed treatments which contain fludioxonil will give some control for seed known to be infected.

**Cultural control:** A strict rotation of peas and beans is necessary to prevent the build-up of these diseases in the soil. Peas and beans should be treated as one and the same crop and a break of at least four years should elapse between crops. Consolidated or poorly drained soils can also predispose peas to infection and over working of soils prior to drilling should be avoided. A predictive soil test has been developed to avoid planting peas in high-risk fields and is available from Processors and Growers Research Organisation.

There are no varieties currently available which are resistant to these diseases. Use healthy seed.

**Leaf and pod spot (*Ascochyta pisi, Mycosphaerella pinodes, Phoma medicaginis var. pinodella*)**

This group of diseases, caused by three closely related fungi, is also referred to as the 'Ascochyta complex'. All are seed-borne, but *M. pinodes* and *P. medicaginis* can also survive in the soil for several years. *P. medicaginis* also causes a foot rot. The most common leaf and pod spotting is caused by *M. pinodes*. In wet weather, many small dark-brown or purple spots develop small, circular, sunken spots, brown to black in colour and 1-2mm in diameter. In severe infection, the plants may be defoliated and patches die prematurely.

**Chemical control:** The fungi are seed-borne and if tested seed is found to be infected then seed treatments containing fludioxonil should be used. To prevent leaf and pod spot developing in wet seasons, fungicides can be applied as soon as the first spots are seen on the foliage and repeated two weeks later. In order to reduce pod infection, a spray should be applied as soon as the first pod is visible following a disease risk assessment. In dry seasons, such treatment is unnecessary.

Amistar is approved for use on fresh peas for the control of leaf and pod spot. Some control of grey mould (*Botrytis cinerea*) and Mycosphaerella may also be achieved.

**Cultural control:** Use only healthy seed and avoid excessive overhead irrigation during the pod setting period. Crops that produce a drier microclimate are less likely to become infected. Peas should not be grown more frequently than once in five years on the same land.

**Downy mildew (*Peronospora viciae*)**

Symptoms can appear at any time from emergence onwards. The fungus is soil-borne and commonly infects seedlings before emergence. Infected plants are pale and remain stunted. The undersides of the leaves are thickly covered with grey-mauve coloured velvety mycelium. Infection then spreads from these plants by air-borne spores. Other plants then produce leaves with yellow-green spots or areas on the upper surface of the leaves with the velvety mildew on the underside. The growing points of the plants may also become infected and pods may appear yellow and blotchy, fail to fill and a cottony white growth occurs within the pod wall.

**Chemical control:** There are no effective means of control once the disease has become established. Seed treatments are effective in preventing the initial seedling infection thereby reducing the amount of air-borne inoculum that causes the secondary infection.

**Cultural control:** Avoid planting peas in fields where there has been a history of downy mildew infection. Some early maturing varieties are very susceptible to mildew and these should be avoided in high-risk fields. Later sown crops are not so susceptible to seedling infection. Information on the relative susceptibility of varieties to downy mildew is available in the PGRO Vining Pea Growers Guide.

**Powdery mildew (*Erysiphe pisi*)**

Peas can become infected from early flowering onwards; maincrop and late maturing peas are particularly susceptible. Leaves and stems become covered with a white 'dusty' film. Diseased tissue can then become discoloured and pods may also be severely infected and the produce is spoilt both by the surface pod infection and the failure of such pods to fill adequately. The disease is followed by hot dry conditions during the day and high humidity at night.

**Chemical control:** There are no fungicides approved in peas for the control of powdery mildew although cyproconazole or sulphur may reduce the risk of infection in late sown crops.

**Cultural control:** Several varieties are completely resistant to powdery mildew and these are particularly useful for maincrop and late season planting. Information on the relative susceptibility of varieties to powdery mildew is available in the PGRO Vining Pea Growers Guide

**Botrytis pod rot (*Botrytis cinerea*)**

Pod rot (grey mould) occurs in wet seasons when the flower petal sticks to the developing pods or lodges on the stems in the leaf axis. Botrytis colonises the moribund petals and then infects the pod or stem causing a grey-brown rot, which may eventually become covered with grey fluffy mycelium.

**Chemical control:** In wet seasons, a fungicide should be applied as soon as the first pod is visible. Some fungicides will also control leaf and pod spot. In dry seasons, treatment is unnecessary.

**Cultural control:** The disease is favoured by wet conditions and dense crops are more susceptible to infection.

**Pea enation mosaic virus (*PEMV*)**

The symptoms are not often noticed until the flowering or pod setting stage. The virus causes vein clearing and the formation of translucent spots on the leaves and stipules. Leaves may be crinkled and the top of the plant becomes yellow and mottled. Pods may be distorted or develop sharp ridges across or along the surface. Infected plants can appear in patches as the virus is transmitted by the pea aphid.

**Chemical control:** Control of aphid infestation will prevent the virus becoming established.

**Cultural control:** The disease is not seed-borne. Some newer varieties are resistant to PEMV. The virus can also infect broad and field beans and sweet peas and cropping in close proximity to these alternative hosts should be avoided.

**Pea bacterial blight (*Pseudomonas syringae pv pisi*)**

Although not often seriously affecting spring sown peas, autumn planted crops may develop symptoms particularly if the peas have been damaged by a late spring frost. Leaves and stems develop water-soaked lesions that may extend into larger areas. Eventually such lesions dry out and turn brown, stems may collapse and pods also develop water soaked spotting together with bacterial ooze.

**Chemical control:** There is no means of controlling pea blight.

**Cultural control:** The use of healthy seed is essential, especially for varieties that are planted in the autumn or early spring. A seed test is available from Processors and Growers Research Organisation, NIAB and SASA.

## WEED CONTROL

Weed infestations cause yield depression of peas. Some weeds in particular, such as small nettle and thistle, interfere with hand picking.

Efficient ploughing can reduce many weed problems. An application of glyphosate either pre-harvest of cereals or in autumn before sowing peas, is the most effective way of eradicating perennial grasses. Over-wintered weeds should be eliminated before drilling by cultivations. Any remaining, together with weeds which emerge before the crop, are killed by non-selective herbicides (e.g. glyphosate).

Weed control is achieved with a combination of pre-emergence residual and foliar acting post-emergence herbicides.

Leaf wax can be tested with crystal violet dye. If herbicides containing MCPB are applied after flower buds can be found in the terminal shoot, abscission of the pods may result. Information on pea leaf wax assessment is available from the Processors Growers Research Organisation.

Work has indicated the usefulness of mechanical weeding techniques to control seedling annual weeds. This technique is suitable for light soils and should be carried out in dry conditions. Weeding can be made either across or in the direction of the pea rows when the peas are between the second and fifth node growth stage. The technique is not suitable for grass-weeds, perennials or deep-rooted weeds such as black-bindweed, nor is it suitable to control volunteer potatoes. A post-emergence herbicide may be required where late germinating or vigorous weeds become established.

**Problem weeds**

Small nettle can be controlled with most pre-emergence herbicides; thistles with MCPB post-emergence.

Growers must adopt a policy for reducing volunteer problems for oilseed rape and potatoes by using appropriate husbandry practices after harvest of these crops.

After potato harvest, tubers remaining should not be ploughed down as this aids their survival. They should be left on or near the soil surface to be killed by frost or eaten by animals.

Volunteer potatoes can be a severe problem. Every attempt should be made to control them in other crops in the rotation because they cannot be killed in peas.

# NUTRITION

## MAJOR NUTRIENTS

Prior to cropping the field, nutrient status should be determined by sampling and analysis. Fertiliser application should be in accordance with crop needs and soil reserves. Particular care should be taken to avoid build-up of unnecessarily high levels of phosphorus in the soil as this can cause pollution of surface waters.

Nitrogen-fixing Rhizobia bacteria, responsible for root nodulation of peas, occur naturally in UK soils and supply peas with their nitrogen requirement. Applications of nitrogen fertiliser, farm manure or sewage sludge are unnecessary and will delay and suppress nodulation. If peas show symptoms of nitrogen deficiency this may be due to the destruction of root nodules. In conditions of waterlogging, for example, do not apply nitrogen fertiliser as it will not be effective because a damaged root system is unable to take up nitrogen.

Examples of typical fertiliser recommendations are given in The Fertiliser Manual (RB209).

Phosphate and potash are applied as a base fertiliser before cultivation. See Appendix.

Peas may suffer from sulphur deficiency on sandy, shallow or medium textured soils with low organic matter, and which are far from industrial S emissions. Where deficiency is likely, apply 37.5 to 50 kg/ha $SO_3$ to the seed bed before sowing.

Proprietary foliar feeds are unnecessary and unlikely to give lasting beneficial effects. Under some conditions they may cause crop scorch.

### Lime and pH

Peas require a pH of at least 5.9 to 6.5. If the pH is below 5.8 an application of lime will be needed. Over-liming should be avoided as it can induce deficiency of trace elements such as manganese.

### Trace elements

Treatments should only be applied where a deficiency problem has been identified.

Manganese deficiency symptoms are chlorosis between veins and round margins of the leaves. Occasionally ‘Marsh Spot’ disorder, a necrotic spot that appears on the adaxial surfaces of the cotyledons, occurs in picking peas. It occurs where the soil is deficient or where manganese is unavailable to the plant and is common on peaty organic or sandy soils and where the pH is over 6.8. Soil analysis for manganese is of little value. Foliar sprays of manganese sulphate and wetter can correct the deficiency.

Magnesium deficiency is less common, occurring late in the growth of the crop. Symptoms are interveinal chlorosis but the leaf margins remaining green with older leaves affected first. It is more likely to occur on sandy, acid soils and where there is excess potash. Soil analysis will identify the problem. At an index of 0 and if lime is also needed, correction can be made with an application of magnesian limestone (Appendix) either before peas are sown, or elsewhere in the rotation. If crop treatment becomes necessary, corrective foliar sprays with magnesium sulphate should be applied.

**Post harvest cultivations**

Green crop residues from peas have a high nitrogen content and in order to reduce leaching of nitrogen into ground water, ploughing or cultivating them in after harvest should be delayed until just before planting the next crop (see Code for Good Agricultural Practice for the Protection of Water).

## IRRIGATION

Peas are highly responsive to irrigation and scheduling systems will help forecast the timing and the priority order. Peas are most sensitive to soil moisture deficits at the beginning of flowering and during pod swelling. Irrigation during petal fall may increase the occurrence of *Botrytis*.

## RESIDUES AND CONTAMINANTS

Red Tractor Farm Assurance Fresh Produce is aware that a key area in the production of fresh produce which requires continued attention by growers and their advisers is that of keeping pesticide residues to a minimum. This issue is not just one of meeting the MRL trading standard but ensuring that any individual or multi residues are kept as low as possible below this level.

**The key targets are:**

- Optimising late applications of fungicides and insecticides to the edible part of the crop
- Optimising the use of post-harvest treatments
- Ensuring minimum harvests intervals are followed
- Ensuring that application equipment is applying products correctly

Currently there are no residue issues associated with this crop but awareness needs to be maintained for any future issues.

# APPENDIX 1: TYPICAL APPLICATION RATES FOR MAJOR NUTRIENTS

Major nutrient requirements (kg/ha) (Source: Defra Fertiliser Manual RB209)

| Nutrient | Soil Index | | | | |
|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 3+ |
| **Phosphate($P_2O_5$)** | 185 | 135 | 85 | 35 | 0 |
| **Potash ($K_2O$)** | 190 | 140 | 90 (2-)<br>40 (2+)<br>40 (2+) | 0 | 0 |
| **Magnesium [1] (MgO)** | 100 | 50 | 0 | 0 | 0 |

**Notes:**

[1] Magnesium is not necessary for every crop and can be applied elsewhere in the rotation as magnesian limestone on acid soils

These recommendations for P + K are high are to build up soil nutrients in a vegetable rotation. Where there is no plan to raise the soil index level, the recommendations may be reduced by 150 kg/ha at Index 0, 100 kg/ha at Index 1 and 50 kg/ha at Index 2.

The fertiliser is applied prior to cultivation. Not more than 50 kg/ha of $K_20$ should be combine drilled otherwise germination may be affected.

Peas may suffer from sulphur deficiency on sandy, shallow or medium textured soils with low organic matter and which are far from industrial S emissions. Where deficiency is likely apply 37.5 to 50 kg/ha $SO_3$ in the form of keiserite, gypsum or elemental sulphur to the seedbed before sowing.

Consult your retailer before using FYM.

The guidelines in 'Managing Farm Manures for Food Safety: Guidelines for Growers to Minimise the Risks of Microbiological Contamination of Ready to Eat Crops' should be followed (see FSA website **http://www.food.gov.uk**). Picking peas sold fresh are classed as 'Ready to Eat' crops, i.e. they can reasonably be expected to be eaten without any further processing to reduce microbial contamination, other than by washing.

Select fields carefully to avoid risk of indirect contamination via surface run-off from manure heaps or stores, and during or following spreading of manures on the land.

Ensure water sources used on the farm are not contaminated with manures or run-off.

Treated or batch stored solid manures and slurries can be applied before sowing. You should not apply fresh solid manures and slurries within 12 months of harvest, subject to there also being a minimum of 6 months between application and sowing.

Untreated and digested sewage sludge must not be applied within the crop rotation.

Only advanced treated sewage sludge may be used within the crop rotation and it must not be applied within 10 months of harvest. Applications shall be carried out in accordance with the Regulations and the current Defra Code for the Agricultural Use of Sewage Sludge.

## NOTES

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Red Tractor Assurance

# Certification Bodies

## Your routine point of contact with the Scheme is through your Certification Body.

Certification Bodies are licensed by Red Tractor to manage membership applications and to carry out assessment and certification against the Standards. The table below shows which Certification Bodies apply to each enterprise.

| Certification Body | Beef and Lamb | Dairy | Combinable Crops and Sugar Beet | Fresh Produce | Pigs | Poultry |
|---|---|---|---|---|---|---|
| NSF | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Kiwa PAI | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| SAI Global | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| SFQC | ✔ | ✔ | ✔ | ✔ | | |
| NIFCC (Northern Ireland) | | ✔ | | | | ✔ |
| QWFC (Wales) | | ✔ | | | | |

NSF Certification

**NSF Certification**
Hanborough Business Park
Long Hanborough
Oxford OX29 8SJ
Tel: 01993 885739
Email: agriculture@nsf.org
Web: www.nsf-foodeurope.com

PAI kiwa Partner for progress

**Kiwa PAI**
The Inspire,
Hornbeam Square West, Harrogate,
North Yorkshire HG2 8PA
Tel: 01423 878878
Email: paienquiries@kiwa.co.uk
Web: www.kiwa.co.uk/pai

SAI GLOBAL ASSURANCE SERVICES

**SAI Global Assurance Services Ltd**
PO Box 6236,
Milton Keynes MK1 9ES
Tel: 01908 249973
Email: agrifood@saiglobal.com
Web: www.saiglobal.com/assurance

SFQC
Specialist assurance for the food and farming sectors

**SFQC Ltd**
Royal Highland Centre,
10th Avenue, Ingliston,
Edinburgh EH28 8NF
Tel: 0131 335 6605
Email: redtractor@sfqc.co.uk
Web: www.sfqc.co.uk

NIFCC
NORTHERN IRELAND FOOD CHAIN CERTIFICATION

**NIFCC [Northern Ireland]**
Lissue House,
31 Ballinderry Rd, Lisburn,
Northern Ireland BT28 2SL
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Web: www.nifcc.co.uk

QWFC

**QWFC [Wales]**
PO Box 8, Gorseland,
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Aberystwyth SY23 2WB
Tel: 01970 636688
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Web: www.wlbp.co.uk

Red Tractor Assurance *for Farms*

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# Fresh Produce Standards